UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/427,078 | 10/26/1999 | KENICHI SAWADA | 018656-104 | 2696 |

21839 7590 02/22/2006

BUCHANAN INGERSOLL PC
(INCLUDING BURNS, DOANE, SWECKER & MATHIS)
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

| EXAMINER | |
|---|---|
| YE, LIN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2615 | |

DATE MAILED: 02/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/427,078 | SAWADA ET AL. | |
| | Examiner | Art Unit | |
| | Lin Ye | 2615 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *6-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 October 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicants' arguments filed 12/21/05 have been fully considered but they are not persuasive as to claims 6-29.

For claims 6, 11 and 17, the applicants argue that the Kobayashi reference (U.S. Patent 5,414,536) does not show, teach or suggest a ladder pattern of vertical lines, each one of which is present for every n pixels of the sensor, wherein $1 \leq n \leq M / 2$ is satisfied for n when M is the total pixel number of the sensor, because " *a ladder pattern 52 of 41p (line pair)/mm*" in column 4, line 49 of Kobayashi should in fact read " *4 lp (line pair)/mm*" with reference to paragraph 0015 of the laid Open Patent Application No. HEI 6-46260. Thus, in Kobayashi, each vertical line of the ladder pattern is present for every 25 $\mu$m (1/4mm) while a pixel pitch of the CCD sensor is 8 $\mu$m. Therefore, about three vertical lines are present for every one pixel in the Kobayashi reference (See Applicants' REMARKS page 12, lines 13 through page 13, line 5).

The examiner disagrees. The Japanese Laid Open Patent Application NO. HEI 6-46260 discloses "*a ladder pattern 52 of 41p (line pair)/mm*", and it does not disclose "*4 lp (line pair)/mm*" as argued by Applicants (e.g., the examiner has made an English translation of HEI 6-46260 from Japan Patent Office Web Site, and the copy of translation is attached with this Office Action). Nowhere in Kobayashi reference shows "each vertical line of the ladder pattern is present for every 25 $\mu$m (1/4mm) while a pixel pitch of the CCD sensor is 8 $\mu$m" as

argued by Applicants. It also should be noted that 1/4mm is equal to 250 μm. The examiner does not understand how the applicants stated "...25 μm (1/4mm)...".

The Kobayashi reference clearly shows in Figures 4 and 5, an image pickup device comprising three image sensor line (40); each image sensor line (40) is formed of a plurality of CCD elements (41) disposed at a constant pitch p (the pitch p is referred as "41p"); a ladder pattern (50, see Col. 4, lines 40-43) for using on the color image correction to correct a decay image caused by optical system (See Col. 1, lines 60-65); the vertical ladder patterns (52) contained in the ladder pattern (50) are considered as the ladder pattern (50) of vertical lines; and "*a ladder pattern 52 of 41p (line pair)/mm*" and Figures 4 and 5 clearly show the width of each vertical ladder pattern (52) is equal to pitch 41p. Therefore, each one of ladder pattern (52) is present fore every n pixels of said sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor (e.g., the Figure 4 shows the total number of the sensor elements 41 is **20**, the Figure 5 shows the number of vertical ladder pattern 52 is **8).**

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 6-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komiya et al. U.S. Patent 6,097,430 in view of Kobayashi U.S. Patent 5,414,536.

Referring to claim 6, the Komiya reference discloses in Figures 1-2, 14A-B and 15, an image pick-up device comprising: a sensor (image pickup element 60, See Col. 5, lines 12-15) which picks up an image through a lens (59); a setting unit (Aberration correction calculation section 48 and distortion aberration correction table 27, see Figure 15, See Col. 12, lines 15-19) which sets chromatic aberration factors (a1 and a 2) based on the image data picked from a predetermined pattern (See Figure 14A, nine slid dots as a pattern on a sheet 47, and see Col. 11, lines 65-67 and Col. 12, lines 1-4), wherein said predetermined pattern corresponds to a pick-up resolution (e.g., the pick-up resolution of image sensor corresponds to the distance of adjacent pixels; the distance between the center pixel to the adjacent pixels in high pick-up resolution are smaller than the distance between the center pixel to the adjacent pixels in low pick-up resolution. The Komiya reference discloses in Figure 3B, the aberration cause by the distance from the center pixel - the center of lens corresponds to the position of center pixel, this means that more aberration at the edge of sensor compared to at the central part of sensor; an in Figure 14B, shows a distorted state resulting from the aberration from a predetermined pattern, e.g., dots pattern, the center dot corresponds to center pixel of sensor, see Col. 12, lines 1-19; the aberration factors a1, a2 for aberration correction is bases on the distance from aberration pixel to center pixel , see equation 1, Col. 6, lines 40 and 48-58. Therefore, the high pick-up resolution of image sensor has less aberration from the adjacent pixels to the center pixel than the low pick-up resolution of image sensor. For those reasons, in order to obtain the high accurate aberration factors, the

predetermined pattern disclosed by the Komiya reference corresponds to a pick-up resolution inherently); and a correction unit (distortion aberration correction section 28, see Figure 4A) which corrects image data picked up from an original image by using the chromatic aberration factors (a1 and a2) set by the setting unit (See Col. 7, lines 50-62). However, the Komiya reference does not explicitly show the predetermined pattern is a ladder pattern of vertical lines, each one of which is present for every n pixels of the sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor.

The Kobayashi reference teaches in Figures 2-5, an image pickup device comprising three image sensor line (40); each image sensor line (40) is formed of a plurality of CCD elements (41) disposed at a constant pitch p (the pitch p is referred as "41p"); a ladder pattern (50, see Col. 4, lines 40-43) for using on the color image correction to correct a decay image caused by optical system (See Col. 1, lines 60-65); the vertical ladder patterns (52) contained in the ladder pattern (50) are considered as the ladder pattern (50) of vertical lines; and "*a ladder pattern 52 of 41p (line pair)/mm*" and Figures 4 and 5 clearly show the width of each vertical ladder pattern (52) is equal to pitch 41p. Therefore, each one of ladder pattern (52) is present fore every n pixels of said sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor (e.g., the Figure 4 shows the total number of the sensor elements 41 is 20, the Figure 5 shows the number of vertical ladder pattern 52 is 8); and a width of the ladder pattern (50) is equal to a width of a plurality of pixels in an auxiliary scanning direction (direction A) and a length of the ladder pattern is equal to a length of an entire scanning span in a main scanning direction (direction B) as shown in Figure 3. The Kobayashi reference is evidence that one of ordinary skill in the art at the time to see more

advantages for the image pick-up system using the ladder pattern corresponds to pixel pitch of the image sensor, and a width of the ladder pattern is equal to a width of a plurality of pixels in an auxiliary scanning direction and a length of the ladder pattern is equal to a length of an entire scanning span in a main scanning direction; and the number of vertical lines of the ladder pattern corresponds to a ration of one for every n pixels ($1 \leq n \leq M/2$) to provide the image pick-up system capable of correcting the color image aberration more accurately and drawing high quality image information from an original image. For that reason, it would have been obvious one of ordinary skill in the art at the time to modify the image pick-up device of the Komiya ('430) for providing a ladder pattern of vertical lines, each one of which is present for every n pixels of the sensor, wherein $1 \leq n \leq M/2$ is satisfied for n when M is the total pixel number of the sensor as taught by Kobayashi ('536).

Referring to claim 7, the Komiya and Kobayashi references disclose all subject matter as discussed in respected to claim 6, and the Komiya reference discloses wherein the predetermined pattern is formed on a chromatic aberration board (sheet 47) as shown in Figure 14A.

Referring to claim 8, the Komiya and Kobayashi references disclose all subject matter as discussed in respected to claims 6-7, and the Komiya reference discloses wherein the chromatic aberration board (47) is fixed in an area near a document platen (46) as shown in Figure 15.

Referring to claim 9, the Komiya and Kobayashi references disclose all subject matter as discussed in respected claim 6, and the Kobayashi reference discloses the predetermined pattern (50) is a ladder pattern.

Referring to claim 10, the Komiya and Kobayashi references disclose all subject matter as discussed in respected to claim 6, and the Komiya reference discloses wherein the chromatic aberration factors (a1 and a2) are set for each color (RGB signals 13r, 13g and 13b, see Col. 8, lines 17-22) component (See Col. 7, lines 50-67).

Referring to claim 11, the Komiya and Kobayashi references disclose all subject matter as discussed in respected to claim 6, and the Komiya reference also discloses memory (distortion aberration correction table 27), which stores the calculated chromatic aberration factors (a1 and a2, see Col. 6, lines 14-20).

Referring to claim 12, the Komiya and Kobayashi references disclose all subject matter as discussed in respected with same comments to claims 7 and 11.

Referring to claim 13, the Komiya and Kobayashi references disclose all subject matter as discussed in respected with same comments to claims 8 and 11-12.

Referring to claim 14, the Komiya and Kobayashi reference discloses all subject matter as discussed in respected claim 11, and the Kobayashi reference discloses the predetermined pattern (50) is a ladder pattern.

Referring to claim 15, the Komiya and Kobayashi references disclose all subject matter as discussed in respected to claims 7 and 11, and the Komiya reference discloses wherein the memory (23) is a line memory (having table 7 for storing the aberration factors a1 and a2, see Col. 12, lines 10-19).

Referring to claim 16, the Komiya and Kobayashi references disclose all subject matter as discussed in respected with same comments to claims 10-11.

Referring to claim 17, the Komiya and Kobayashi references disclose all subject matter as discussed in respected to claim 6, except that the Komiya reference does not explicitly show a determining unit which determines a character amount of the image data picked up from the pattern image and setting the chromatic aberration factors based on the character amount.

The Kobayashi reference teaches in Figures 2-5, an image pickup device has a ladder pattern (50, see Col. 4, lines 40-43) for using on the color image correction to correct a decay image caused by optical system (See Col. 1, lines 60-65); a determining unit (a position detection means 6 and color component detection means 7, see Col. 2, lines 7-15 and lines 30-35) which determines a character amount of the image data picked up from the pattern image; a setting unit (imaging performance setting means 8 and the factor generation circuit 77) which sets correction factors based on the character amount (See Col. 5, lines 15-28). The Kobayashi reference is evidence that one of ordinary skill in the art at the time to see more advantages for the image pick-up system using the predetermined pattern to determines a character amount of the image data and setting image correction factors based on the character amount so that the image correction information which has been measured in advance with a standard measuring system and read out the information from the memory when the criterion is set to the simplicity of arrangement (See Col. 2, lines 54-68). For that reason, it would have been obvious one of ordinary skill in the art at the time to modify the image pick-up device of the Komiya ('430) for providing the determining unit which determines a character amount of the image data picked up from the pattern image and the chromatic aberration factors based on the character amount as taught by Kobayashi ('536).

Referring to claim 18, the Komiya and Kobayashi references disclose all subject matter as discussed in respected to claim 17, and the Kobayashi reference discloses wherein the memory (75, See Col. 5, lines 15-19) which stores the determined character amount and outputs the character amount to the setting unit, and the setting unit (the factor generation circuit 77) includes a table (lookup table) which stores the relationship between the chromatic aberration (decay correction) factors and the character amount (See Col. 5, lines 34-47).

Referring to claim 19, the Komiya and Kobayashi references disclose all subject matter as discussed in respected to claim 17, and the Kobayashi reference discloses in Figure 9, wherein the device further comprises an extraction unit (address selection circuit 80) which extracts a changing point of the character amount (address alteration circuit 82), and a memory (75) which stores the changing point and outputs the changing point to the setting unit, and the setting unit includes a table (in the factor generation circuit 77) which stores the relationship between the chromatic aberration factors and the changing point (See Col. 5, lines 50-68 and Col. 6, lines 1-13).

Referring to claim 20, the Komiya and Kobayashi references disclose all subject matter as discussed with respected to same comment as with claims 7 and 17.

Referring to claim 21, the Komiya and Kobayashi references disclose all subject matter as discussed with respected to same comment as with claims 8 and 17.

Referring to claim 22, the Komiya and Kobayashi references disclose all subject matter as discussed with respected to same comment as with claims 9 and 17.

Referring to claim 23, the Komiya and Kobayashi references disclose all subject matter as discussed with respected to same comment as with claims 10 and 17.

Referring to claims 24 and 27, the Komiya and Kobayashi references disclose all subject matter as discussed with respected to claim 9, and the Kobayashi discloses wherein the number of vertical lines of the ladder pattern (52, see Col. 4, lines 49-50) corresponds to a ration of one for every n pixels ($1 \leq n \leq M/2$) in accordance with the pick-up resolution as shown in Figures 4-5 (e.g., the number of vertical pattern 52 is less than ½ number of pixels 41 in the image sensor 40); and a width of the ladder pattern (50) is equal to a width of a plurality of pixels in an auxiliary scanning direction (direction A) and a length of the ladder pattern is equal to a length of an entire scanning span in a main scanning direction (direction B) as shown in Figure 3.

Referring to claims 25 and 28, the Komiya and Kobayashi references disclose all subject matter as discussed with respected to same comment as with claims 24 and 27.

Referring to claims 26 and 29, the Komiya and Kobayashi references disclose all subject matter as discussed with respected to same comment as with claims 24 and 27.

***Conclusion***

4. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

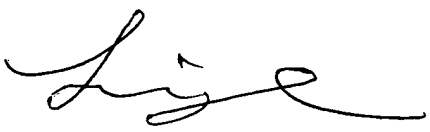
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until

after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lin Ye whose telephone number is (571) 272-7372. The examiner can normally be reached on Mon-Fri 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Lin Ye
Examiner
Technology Division 2622

February 18, 2006